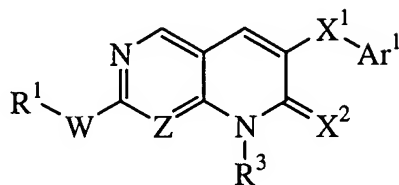
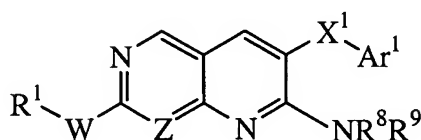


**WHAT IS CLAIMED IS:**

1. A compound of the Formula I or II



**Formula I**



**Formula II**

- 10 or pharmaceutically acceptable salts thereof,  
wherein:

Z is N or CH;

W is  $NR^2$ ;

- 15  $X^1$  is O,  $NR^4$  (where  $R^4$  is hydrogen or alkyl), S, or  $CR^5R^6$  (where  $R^5$  and  $R^6$   
are independently hydrogen or alkyl) or  $C=O$ ;

$X^2$  is O or  $NR^7$ ;

$Ar^1$  is aryl or heteroaryl;

- 20  $R^2$  is hydrogen alkyl, acyl, alkoxycarbonyl, aryloxycarbonyl,  
heteroalkylcarbonyl, heteroalkyloxycarbonyl or  $-R^{21}-R^{22}$  where  $R^{21}$  is alkylene or  $-C(=O)-$   
and  $R^{22}$  is alkyl or alkoxy;

- 25  $R^1$  is hydrogen, alkyl, haloalkyl, aryl, aralkyl, heteroaryl, heteroaralkyl,  
cycloalkyl, cycloalkylalkyl, heteroalkylsubstituted cycloalkyl, heterosubstituted cycloalkyl,  
heteroalkyl, cyanoalkyl, heterocyclyl, heterocyclylalkyl,  $R^{12}-SO_2$ -heterocycloamino (where  
 $R^{12}$  is haloalkyl, aryl, aralkyl, heteroaryl or heteroaralkyl),  $-Y^1-C(O)-Y^2-R^{11}$  (where  $Y^1$  and  
 $Y^2$  are independently either absent or an alkylene group and  $R^{11}$  is hydrogen, alkyl, haloalkyl,

hydroxy, alkoxy, amino, monoalkylamino or dialkylamino), (heterocyclyl)(cycloalkyl)alkyl or (heterocyclyl)(heteroaryl)alkyl;

5  $R^3$  is hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, haloalkyl, heteroalkyl, cyanoalkyl, alkylene-C(O)- $R^{31}$  (where  $R^{31}$  is hydrogen, alkyl, hydroxy, alkoxy, amino, monoalkylamino or dialkylamino), amino, monoalkylamino, dialkylamino or  $NR^{32}$ - $Y^3$ - $R^{33}$  (where  $Y^3$  is -C(O), -C(O)O-, -C(O)NR<sup>34</sup>, S(O)<sub>2</sub> or S(O)<sub>2</sub>NR<sup>35</sup>;  $R^{32}$ ,  $R^{34}$  and  $R^{35}$  are independently hydrogen or alkyl; and  $R^{33}$  is hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, heteroalkyl or optionally substituted phenyl ) or acyl;

$R^7$  is hydrogen or alkyl; and

10  $R^8$  and  $R^9$  are independently hydrogen, alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heteroalkyl, alkylsulfonyl, arylsulfonyl, -C(O)- $R^{81}$  (where  $R^{81}$  is alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heteroalkyl, alkoxy, aryloxy, amino, mono- or dialkylamino, arylamino or aryl(alkyl)amino) or  $R^8$  and  $R^9$  together form =CR<sup>82</sup>R<sup>83</sup> (where  $R^{82}$  and  $R^{83}$  are independently hydrogen, alkyl, cycloalkyl, cycloalkylalkyl or optionally substituted phenyl).  
15 or pharmaceutically acceptable salts thereof,

2. The compound of Claim 1,

wherein:

20 Z is N or CH;

W is NR<sup>2</sup> or O;

$X^1$  is O, NR<sup>4</sup> (where  $R^4$  is hydrogen or alkyl), S, or CR<sup>5</sup>R<sup>6</sup> (where  $R^5$  and  $R^6$  are independently hydrogen or alkyl) or C=O;

$X^2$  is O or NR<sup>7</sup>;

25 Ar<sup>1</sup> is aryl or heteroaryl;

$R^2$  is hydrogen or alkyl;

$R^1$  is hydrogen, alkyl, haloalkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heteroalkylsubstituted cycloalkyl, heterosubstituted cycloalkyl, heteroalkyl, cyanoalkyl, heterocyclyl, heterocyclylalkyl, -Y<sup>1</sup>-C(O)-Y<sup>2</sup>- $R^{11}$  (where Y<sup>1</sup> and Y<sup>2</sup> are independently either  
30 absent or an alkylene group and  $R^{11}$  is hydrogen, alkyl, haloalkyl, hydroxy, alkoxy, amino,

monoalkylamino or dialkylamino), (heterocyclyl)(cycloalkyl)alkyl or (heterocyclyl)(heteroaryl)alkyl;

5  $R^3$  is hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, haloalkyl, heteroalkyl, cyanoalkyl, alkylene-C(O)- $R^{31}$  (where  $R^{31}$  is hydrogen, alkyl, hydroxy, alkoxy, amino, monoalkylamino or dialkylamino), amino, monoalkylamino, dialkylamino or  $NR^{32}$ - $Y^3$ - $R^{33}$  (where  $Y^3$  is -C(O), -C(O)O-, -C(O)NR<sup>34</sup>, S(O)<sub>2</sub> or S(O)<sub>2</sub>NR<sup>35</sup>;  $R^{32}$ ,  $R^{34}$  and  $R^{35}$  are independently hydrogen or alkyl; and  $R^{33}$  is hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, heteroalkyl or optionally substituted phenyl ) or acyl;

$R^7$  is hydrogen or alkyl; and

10  $R^8$  and  $R^9$  are independently hydrogen, alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heteroalkyl, alkylsulfonyl, arylsulfonyl, -C(O)- $R^{81}$  (where  $R^{81}$  is alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heteroalkyl, alkoxy, aryloxy, amino, mono- and dialkylamino, arylamino or aryl(alkyl)amino) or  $R^8$  and  $R^9$  together form =CR<sup>82</sup>R<sup>83</sup> (where  $R^{82}$  and  $R^{83}$  are independently hydrogen, alkyl, cycloalkyl, cycloalkylalkyl or optionally substituted phenyl).

3. The compound of Claim 2, wherein Z is N.

4. The compound of Claim 3, wherein W is NH.

5. The compound of Claim 4, wherein Ar<sup>1</sup> is optionally substituted phenyl.

20 6. The compound of Claim 5, wherein X<sup>1</sup> is O or CH<sub>2</sub>.

7. The compound of Claim 6, wherein X<sup>1</sup> is O.

8. The compound of Claim 7 wherein R<sup>1</sup> is aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heteroalkylsubstituted cycloalkyl, heterosubstituted cycloalkyl, heteroalkyl, heterocyclyl or heterocyclylalkyl.

25

9. The compound of Claim 8, wherein R<sup>1</sup> is heteroalkylsubstituted cycloalkyl, heterosubstituted cycloalkyl, heteroalkyl or heterocyclyl.

10. The compound of Claim 9, wherein  $R^1$  is heterocyclyl.
11. The compound of Claim 9, wherein  $R^1$  is heteroalkyl.
12. The compound of Claim 11, wherein  $R^1$  is hydroxyalkyl.
- 5
13. The compound of Claim 9, wherein  $Ar^1$  is 2-substituted-phenyl, 4-substituted-phenyl or 2,4-disubstituted-phenyl.
14. The compound of Claim 13, wherein  $Ar^1$  is 2-chlorophenyl, 2-fluorophenyl, 2-methylphenyl, 2-fluoro-4-methylphenyl, 4-fluoro-2-methyl or 2,4-difluorophenyl.
- 10
15. The compound of Claim 8 of Formula I, wherein  $X^2$  is O and  $R^3$  is methyl.
- 15
16. The compound of Claim 15, wherein  $R^1$  is heteroalkylsubstituted cycloalkyl, heterosubstituted cycloalkyl, heteroalkyl or heterocyclyl.
17. The compound of Claim 16, wherein  $R^1$  is heterocyclyl.
18. The compound of Claim 16, wherein  $R^1$  is heteroalkyl.
19. The compound of Claim 18, wherein  $R^1$  is hydroxyalkyl.
- 20
20. The compound of Claim 16 wherein  $Ar^1$  is 2-substituted-phenyl, 4-substituted-phenyl or 2,4-disubstituted-phenyl.
21. The compound of Claim 20, wherein  $Ar^1$  is 2-chlorophenyl, 2-fluorophenyl, 2-methylphenyl, 2-fluoro-4-methylphenyl or 2,4-difluorophenyl.
22. The compound of Claim 8 of Formula I, wherein  $X^2$  is  $NR^7$  and  $R^3$  is methyl.
- 25
23. The compound of Claim 22, wherein  $R^1$  is heteroalkylsubstituted cycloalkyl, heterosubstituted cycloalkyl, heteroalkyl or heterocyclyl.
24. The compound of Claim 23, wherein  $R^1$  is heterocyclyl.
25. The compound of Claim 23, wherein  $R^1$  is heteroalkyl.
- 30
26. The compound of Claim 25, wherein  $R^1$  is hydroxyalkyl.

27. The compound of Claim 23, wherein Ar<sup>1</sup> is 2-substituted-phenyl, 4-substituted-phenyl or 2,4-disubstituted-phenyl.

28. The compound of Claim 27, wherein Ar<sup>1</sup> is 2-chlorophenyl, 2-fluorophenyl, 2-methylphenyl, 2-fluoro-4-methylphenyl or 2,4-difluorophenyl.

5 29. The compound of Claim 8 of Formula II, wherein R<sup>8</sup> is hydrogen and R<sup>9</sup> is alkyl, alkylsulfonyl or -C(O)-R<sup>81</sup> (where R<sup>81</sup> is alkyl, alkoxy, aryloxy, amino, monoalkylamino or dialkylamino).

30. The compound of Claim 29, wherein R<sup>1</sup> is heteroalkylsubstituted cycloalkyl, heterosubstituted cycloalkyl, heteroalkyl or heterocyclyl.

10 31. The compound of Claim 30, wherein R<sup>1</sup> is heterocyclyl.

32. The compound of Claim 31, wherein R<sup>1</sup> is heteroalkyl.

33. The compound of Claim 32, wherein R<sup>1</sup> is hydroxyalkyl.

34. The compound of Claim 30, wherein Ar<sup>1</sup> is 2-substituted-phenyl, 4-substituted-phenyl or 2,4-disubstituted-phenyl.

15 35. The compound of Claim 35, wherein Ar<sup>1</sup> is 2-chlorophenyl, 2-fluorophenyl, 2-methylphenyl, 2-fluoro-4-methylphenyl or 2,4-difluorophenyl.

36. The compound of Claim 21, wherein Ar<sup>1</sup> is 2,4-difluoro-phenyl and R<sup>1</sup> is tetrahydro-2H-pyran-4-yl, i.e., 6-(2,4-difluorophenoxy)-8-methyl-2-(tetrahydro-2H-pyran-4-ylamino)pyrido[2,3-*d*]pyrimidin-7(8*H*)-one.

20 37. The compound of Claim 21, wherein Ar<sup>1</sup> is 2,4-difluoro-phenyl and R<sup>1</sup> is tetrahydro-2H-pyran-4-yl, i.e., 6-(2,4-difluorophenoxy)-8-propyl-2-(tetrahydro-2H-pyran-4-ylamino)pyrido[2,3-*d*]pyrimidin-7(8*H*)-one.

25 38. The compound of Claim 21, wherein Ar<sup>1</sup> is 2,4-difluoro-phenyl and R<sup>1</sup> is tetrahydro-2H-pyran-4-yl, i.e., 6-(2,4-difluorophenoxy)-8-cyclopropyl-2-(tetrahydro-2H-pyran-4-ylamino)pyrido[2,3-*d*]pyrimidin-7(8*H*)-one.

39. The compound of Claim 19, wherein Ar<sup>1</sup> is 2,4-difluorophenyl and R<sup>1</sup> is 1,3-dimethyl-3-hydroxy-butyl, i.e., 6-(2,4-Difluoro-phenoxy)-2-(3-hydroxy-1,3-dimethyl-butylamino)-8-methyl-8H-pyrido[2,3-*d*]pyrimidin-7-one.

30 40. The compound of Claim 39 that is 6-(2,4-Difluoro-phenoxy)-2-(3-hydroxy-1(S),3-dimethyl-butylamino)-8-methyl-8H-pyrido[2,3-*d*]pyrimidin-7-one.

41. The compound of Claim 39 that is 6-(2,4-Difluoro-phenoxy)-2-(3-hydroxy-1(R),3-dimethyl-butylamino)-8-methyl-8H-pyrido[2,3-d]pyrimidin-7-one.

42. The compound of Claim 1 of Formula I, wherein:

5  $R^2$  is acyl, alkoxycarbonyl, aryloxycarbonyl, heteroalkylcarbonyl, heteroalkyloxycarbonyl or  $-R^{21}-R^{22}$  where  $R^{21}$  is alkylene or  $-C(=O)-$  and  $R^{22}$  is alkyl or alkoxy.

43. The compound of Claim 42, wherein  $R^1$  is heteroalkyl or heterocyclyl.

44. The compound of Claim 43, wherein,  $R^1$  is heterocyclyl.

10 45. The compound of Claim 44, wherein  $X^1$  is O,  $X^2$  is O and  $R^3$  is methyl.

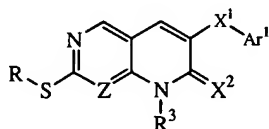
46. The compound of Claim 45, wherein  $R^2$  is acyl.

47. The compound of Claim 46, wherein  $Ar^1$  is 2,4-difluoro-phenyl,  $R^1$  is tetrahydro-2H-pyran-4-yl and  $R^2$  is acetyl

48. A composition comprising:

15 (a) a pharmaceutically acceptable excipient; and  
(b) a compound of Claim 1 or pharmaceutically acceptable salts thereof.

49. A method for preparing a sulfide compound of the formula:



20 wherein:

$Z$  is N or CH;

$X^1$  is O,  $NR^4$  (where  $R^4$  is hydrogen or alkyl), S,  $CR^5R^6$  (where  $R^5$  and  $R^6$  are independently hydrogen or alkyl) or  $C=O$ ;

25  $X^2$  is O;

$Ar^1$  is aryl or heteroaryl;

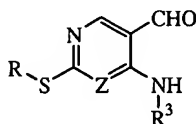
$R$  is alkyl or aryl;

$R^3$  is hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, haloalkyl, heteroalkyl, cyanoalkyl, acyl, alkylene- $C(O)-R^{31}$  (where  $R^{31}$  is hydrogen, alkyl, hydroxy,

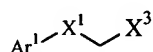
alkoxy, amino, monoalkylamino or dialkylamino), amino, monoalkylamino, dialkylamino or  $\text{NR}^{32}\text{-Y}^3\text{-R}^{33}$  (where  $\text{Y}^3$  is  $-\text{C}(\text{O})$ ,  $-\text{C}(\text{O})\text{O}-$ ,  $-\text{C}(\text{O})\text{NR}^{34}$ ,  $\text{S}(\text{O})_2$  or  $\text{S}(\text{O})_2\text{NR}^{35}$ ;  $\text{R}^{32}$ ,  $\text{R}^{34}$  and  $\text{R}^{35}$  are independently hydrogen or alkyl; and  $\text{R}^{33}$  is hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, heteroalkyl or optionally substituted phenyl);

5 said method comprising the steps of:

contacting an aldehyde of the formula:



with an aryl compound of the formula:



10

wherein

$\text{X}^3$  is  $-\text{C}(=\text{O})-\text{OR}'$  and  $\text{R}'$  is alkyl,

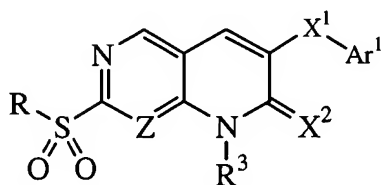
under conditions sufficient to produce said sulfide compound.

50. The method of Claim 49, wherein Z is N

51. The method of Claim 50, wherein  $\text{R}^3$  is hydrogen.

15

52. The method of Claim 49 further comprising producing a sulfonyl compound of the formula:



20

wherein

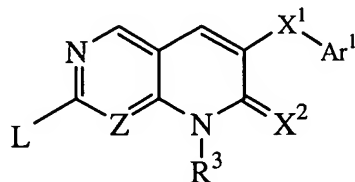
$\text{R}$ ,  $\text{Z}$ ,  $\text{R}^3$ ,  $\text{X}^1$ ,  $\text{X}^2$  and  $\text{Ar}^1$  are as defined in Claim 36,

comprising exposing said sulfide compound to oxidizing conditions to produce said sulfonyl compound.

53. The method of Claim 52, wherein said oxidizing conditions comprise MCPBA, Oxone<sup>®</sup>, periodate or a rhenium peroxide species.

54. A method of preparing a compound of Formula I of Claim 1 comprising the steps of:

5 contacting a compound of Formula IV

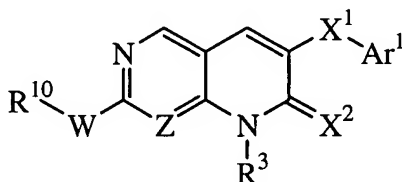


where L is a leaving group;  
with an amine R<sup>1</sup>R<sup>2</sup>NH under nucleophilic displacement conditions.

10

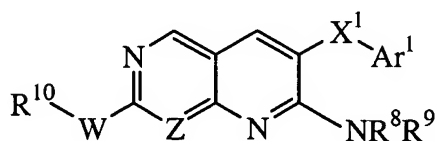
55. The method of Claim 54, wherein L is a group RS(O)<sub>n</sub>- where R is an alkyl or phenyl group and n is an integer from 0 to 2.

56. A compound of Formula I' or II''



15

**Formula I'**



**Formula II''**

wherein:

20

Z is N or CH;

W is S, S(O), S(O)<sub>2</sub> or O;

X<sup>1</sup> is O, NR<sup>4</sup> (where R<sup>4</sup> is hydrogen or alkyl), S, or CR<sup>5</sup>R<sup>6</sup> (where R<sup>5</sup> and R<sup>6</sup> are independently hydrogen or alkyl) or C=O;



$X^2$  is O or  $NR^7$ ;

$Ar^1$  is aryl or heteroaryl;

$R^{10}$  is alkyl, aryl, aralkyl, cycloalkyl or cycloalkylalkyl, or  $R^{10}W$  together form a leaving group or hydroxy;

5  $R^3$  is hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, haloalkyl, heteroalkyl, cyanoalkyl, alkylene- $C(O)-R^{31}$  (where  $R^{31}$  is hydrogen, alkyl, hydroxy, alkoxy, amino, monoalkylamino or dialkylamino), amino, monoalkylamino, dialkylamino or  $NR^{32}-Y^3-R^{33}$  (where  $Y^3$  is  $-C(O)$ ,  $-C(O)O-$ ,  $-C(O)NR^{34}$ ,  $S(O)_2$ , or  $S(O)_2NR^{35}$ ;  $R^{32}$ ,  $R^{34}$  and  $R^{35}$  are independently hydrogen or alkyl; and  $R^{33}$  is hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, heteroalkyl or optionally substituted phenyl) or acyl;

$R^7$  is hydrogen or alkyl; and

$R^8$  and  $R^9$  are independently hydrogen, alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heteroalkyl, alkylsulfonyl, arylsulfonyl,  $-C(O)-R^{81}$  (where  $R^{81}$  is alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heteroalkyl, alkoxy, aryloxy, amino, mono- and di-alkylamino, arylamino or aryl(alkyl)amino) or  $R^8$  and  $R^9$  together form  $=CR^{82}R^{83}$  (where  $R^{82}$  and  $R^{83}$  are independently hydrogen, alkyl, cycloalkyl, cycloalkylalkyl or optionally substituted phenyl).

20 57. A method for treating p38 mediated disorder comprising administering to a patient in need of such treatment, an effective amount of a compound of Claim 1.

58. The method of Claim 57, wherein said p38 mediated disorder is arthritis, Crohns disease, irritable bowel syndrome adult respiratory distress syndrome or chronic obstructive pulmonary disease.

25 59. The method of Claim 57, wherein said p38 mediated disorder is Alzheimer's disease.

\* \* \* \* \*